WHAT IS CLAIMED IS:

1. An outer tube, which is made of silicon carbide, and which has an upper portion closed and a lower portion opened, has the lower portion formed with a tapered portion so as to expand a diameter thereof toward a lower end thereof, and has a flange formed on an outer peripheral side of the lower portion; the following conditions being met:

1) a ratio of t_a/D_1 is from 0.0067 to 0.025,

2) a product of $t_a \times D_1$ is from 600 to 4,000 (mm^2),

3) $(D_{F2}-D_{F1}) \times t_c/(D_1 \times t_a)$ is from 0.1 to 0.7, and

4) L_1/L_2 is from 1 to 10;

where the outer tube has a thickness of t_a (mm) and an inner diameter of D_1 (mm), the flange has a thickness of t_c (mm), an inner diameter of D_{F1} (mm) and an outer diameter of D_{F2} (mm), and the tapered portion has a height L_1 (mm) and an expanse of L_2 (mm).

2. The outer tube according to Claim 1, wherein the tapered portion has upper and lower edges of an inner peripheral side rounded with a radius of 2 mm (R2) or above.

3. The outer tube according to Claim 1, wherein the tapered portion has an inner surface having a surface roughness Ra of not greater than 7 μm.

4. A thermal treatment system using an outer tube, which is made of silicon carbide, and which has an upper portion closed and a lower portion opened, has the lower

portion formed with a tapered portion so as to expand a diameter thereof toward a lower end thereof, and has a flange formed on an outer peripheral side of the lower portion; the following conditions being met:

1) a ratio of t_a/D_1 is from 0.0067 to 0.025,

2) a product of $t_a \times D_1$ is from 600 to 4,000 (mm^2),

3) $(D_{F2} - D_{F1}) \times t_c/(D_1 \times t_a)$ is from 0.1 to 0.7, and

4) L_1/L_2 is from 1 to 10;

where the outer tube has a thickness of t_a (mm) and an inner diameter of D_1 (mm), the flange has a thickness of t_c (mm), an inner diameter of D_{F1} (mm) and an outer diameter of D_{F2} (mm), and the tapered portion has a height L_1 (mm) and an expanse of L_2 (mm).

5. The thermal treatment system according to Claim 4, wherein the tapered portion has upper and lower edges of an inner peripheral side rounded with a radius of 2 mm (R2) or above.

6. The thermal treatment system according to Claim 4, wherein the tapered portion has an inner peripheral side having a surface roughness Ra of not greater than 7 μm.

7. The thermal treatment system according to Claim 4, wherein the height L_1 of the tapered portion satisfies the relationship of $H/4 < L_1 < 3 \cdot H/4$, where a distance between a lowest end of a heater and a bottom surface of the outer tube is H (mm).